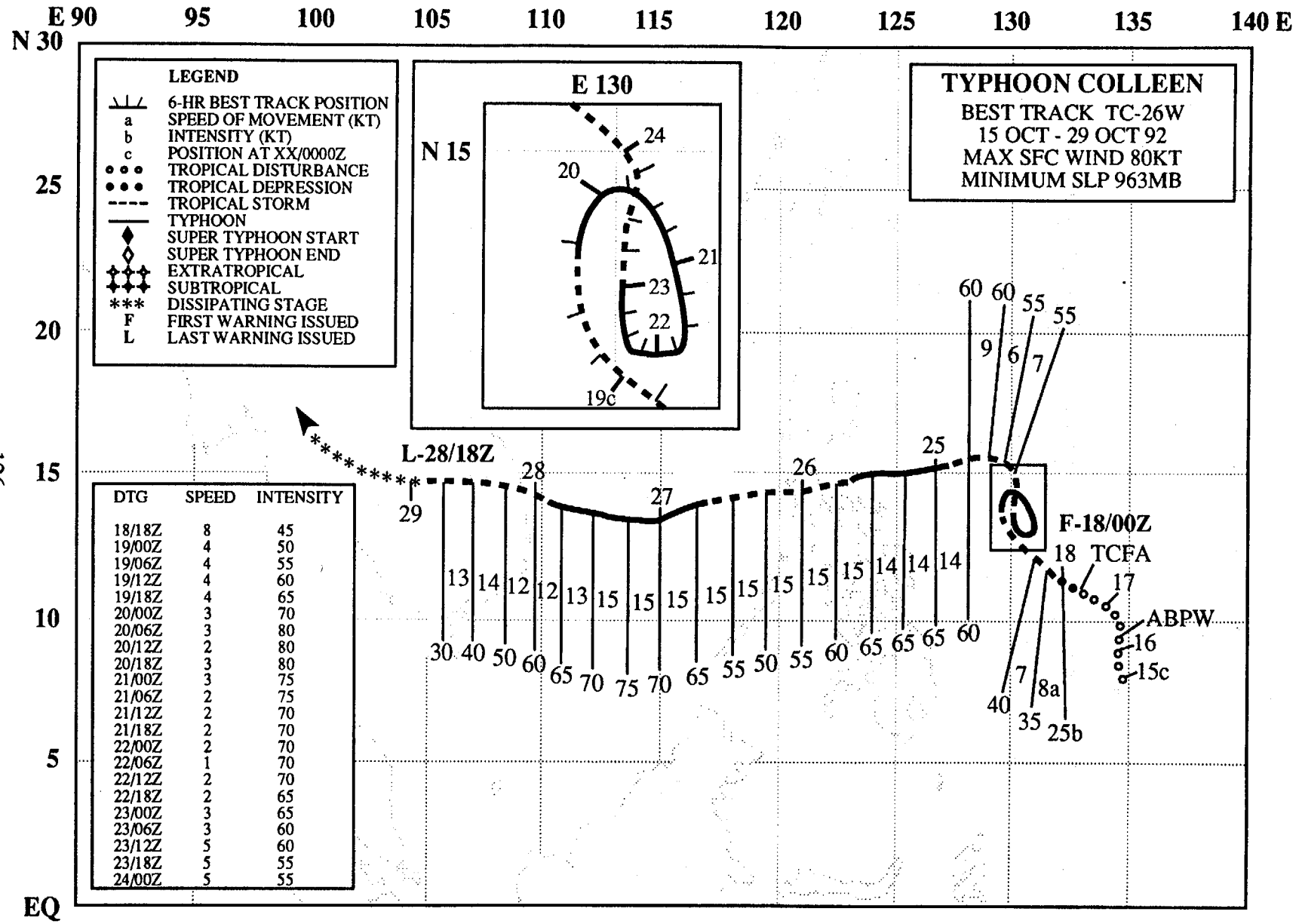
E 90
95
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N 30
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10
5
EQ
126
LEGEND
6-HR BEST TRACK POSITION
a SPEED OF MOVEMENT (KT)
b INTENSITY (KT)
c POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
SUBTROPICAL
*** DISSIPATING STAGE
F FIRST WARNING ISSUED
L LAST WARNING ISSUED
E 130
N 15
TYPHOON COLLEEN
BEST TRACK TC-26W
15 OCT - 29 OCT 92
MAX SFC WIND 80KT
MINIMUM SLP 963MB
L-28/18Z
F-18/00Z
TCFA
ABPW
DTG SPEED INTENSITY
18/18Z 8 45
19/00Z 4 50
19/06Z 4 55
19/12Z 4 60
19/18Z 4 65
20/00Z 3 70
20/06Z 3 80
20/12Z 2 80
20/18Z 3 80
21/00Z 3 75
21/06Z 2 75
21/12Z 2 70
21/18Z 2 70
22/00Z 2 70
22/06Z 1 70
22/12Z 2 70
22/18Z 2 65
23/00Z 3 65
23/06Z 3 60
23/12Z 5 60
23/18Z 5 55
24/00Z 5 55

TYPHOON COLLEEN (26W)

I. HIGHLIGHTS

The third significant tropical cyclone to form as part of the four storm outbreak in mid-October, Colleen developed from a broad cyclonic circulation in the monsoon trough between Typhoon Angela (24W) to the west and Typhoon Brian (25W) to the east. Binary interaction occurred between Colleen and Brian (25W), causing Colleen to make a slow anticyclonic loop in the Philippine Sea before turning west. After crossing Luzon, Colleen reintensified to a typhoon before slamming into central Vietnam and dissipating inland.

II. TRACK AND INTENSITY

Anchored by what was to become Typhoon Angela (24W) in the South China Sea, the monsoon trough extended eastward into the southern Marshall Islands where Typhoon Brian (25W) was developing. The weak low-level circulation, that was to become Colleen, formed in the monsoon trough in the Philippine Sea and was first mentioned on the Significant Tropical Weather Advisory at 160600Z. A Tropical Cyclone Formation Alert was issued by JTWC at 171600Z based on the increased cloud organization in satellite imagery of the disturbance and increasing gradient-level winds at Koror (WMO 91408). Continued intensification during the morning prompted JTWC to issue the first warning at 180000Z. Only six hours later, JTWC upgraded Tropical Depression 26W to Tropical Storm Colleen. But, Tropical Storm Colleen went through several reorganization periods over the first few days as its broad circulation became more vertically aligned. The upper-level flow was shearing the convection to the west while the southwesterly surface flow associated with the monsoon trough forced the low-level to track and reorganize to the east. Despite the strong shear, the cyclone continued to consolidate, and JTWC upgraded Colleen to typhoon intensity on the 191800Z warning.

With regard to the episode of binary interaction, Colleen and Brian (25W) had been, in a relative sense, approaching each other since 15 October (Figure 3-26-1). It became apparent that capture of the two circulations had occurred at 201200Z when they began to orbit around a common point, or centroid (Figures 3-26-2 and 3-26-3). On 22 October, the binary pair reached a minimum separation distance of 680 nm (1260 km). During the binary interaction, Colleen, the larger of the two cyclones, slowed and made an anticyclonic loop as Typhoon Brian accelerated northwestward. On 24 October, Brian escaped to the northeast and recurved. Colleen, which had initially intensified then weakened during the period of interaction, moved westward toward Luzon. Ship reports confirmed that Colleen, with a large ragged eye, had its strongest winds in a ring displaced approximately 40 to 80 nm (75 to 150 km) from the center of the circulation.

While weakening, Colleen passed over central Luzon and then reintensified as it moved into the South China Sea. After peaking at 75 kt (39 m/sec) in the central South China Sea, at 270600Z, Colleen slowly weakened until it made landfall in central Vietnam on the morning of 28 October (Figure 3-26-4). When it was evident that the circulation was dissipating overland, the final warning was issued by JTWC at 281800Z.

III. FORECAST PERFORMANCE

Forecasters at JTWC recognized early on that Colleen was going to be a challenge, and that's exactly how it turned out. Overall the mean track errors were significantly larger than the long term average errors with values of 130, 290 and 500 nm (240, 535 and 925 km) for the 24-, 48- and 72-hour

forecasts, respectively. In addition, JTWC tied at 24 and 48 hours with CLIPER, which is used as a baseline for determining skill, but lost to CLIPER by 10% at the 72-hour point. JTWC forecasters anticipated that interaction could occur with both Angela (24W) to the west and Brian (25W) to the east, but the question was "when, where and how much?" The forecast aids for this cyclone were in poor agreement with each other from the start. In addition, the numerical model, NOGAPS, had a difficult time resolving all three circulations and consistently tried to merge Colleen and Brian (25W). Nevertheless, once Brian (25W) escaped from its interaction with Colleen, JTWC forecasts correctly predicted that Colleen would move to the west.

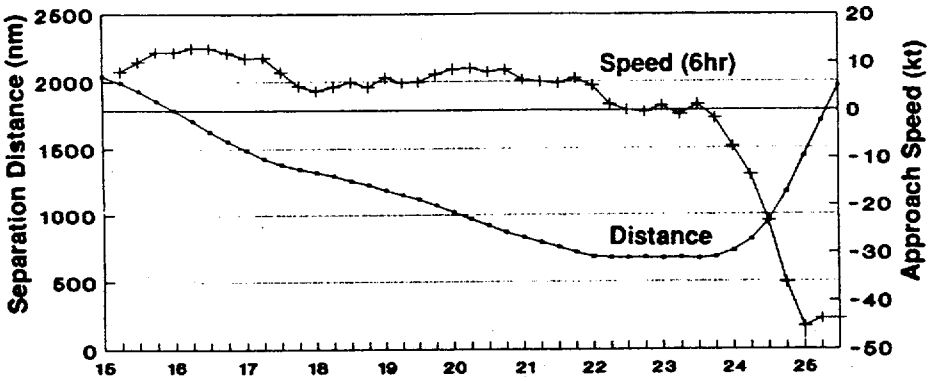

Figure 3-26-1. Graph of the relative separation distances (nm) and speeds of approach (kt) for Colleen and Brian (25W). The closest points of approach between the two typhoons occur on 22 through 24 October.

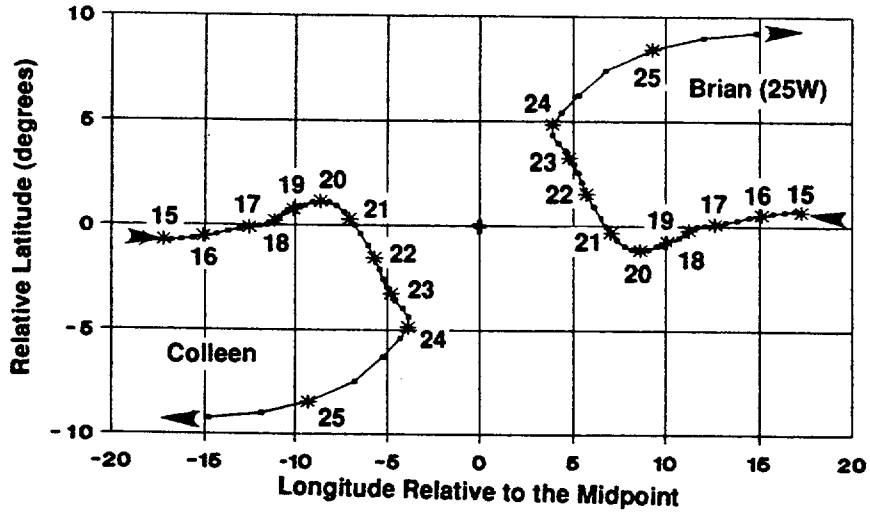

Figure 3-26-2. Graph of binary interaction between Colleen and Brian (25W). The positions, which are relative to a midpoint, show capture at 201200Z, orbit from 201200Z to 240000Z, and escape at 240000Z October.

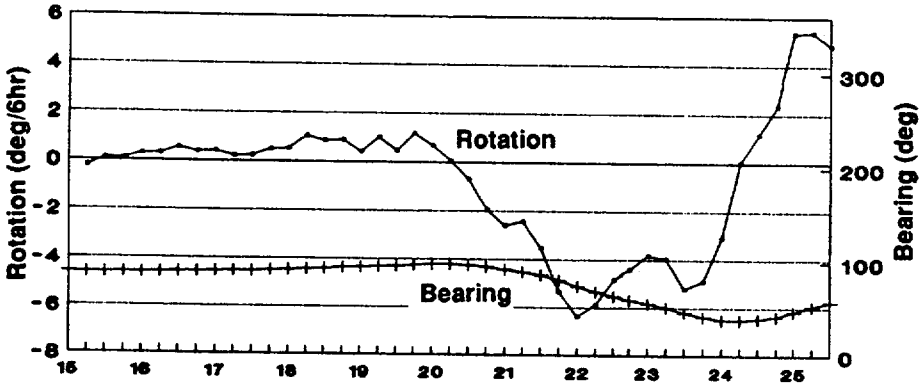

Figure 3-26-3. Graph of Colleen and Brian's rotation (degrees/6 hours) and bearing (degrees) shows that cyclonic rotation (negative values) commenced around 201200Z and ended shortly after 240000Z October.

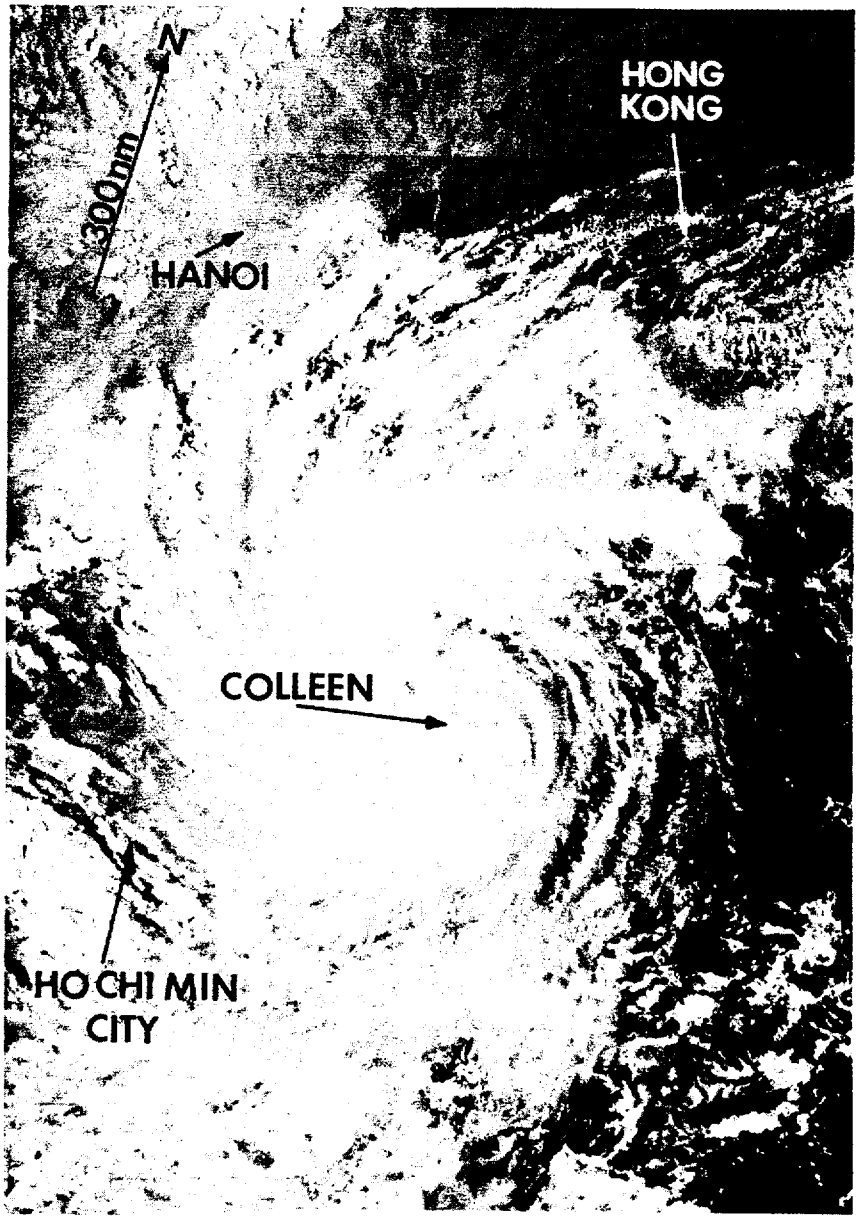

Figure 3-26-4. Typhoon Colleen, at its peak intensity in the South China Sea, is less than a day from making landfall in Vietnam (270915Z October DMSP visual imagery).

IV. IMPACT

On October 21, the Korean iron ore bulk carrier, **Daeyang Honey**, was reported missing in the Philippine Sea. A nine day search effort, involving aircraft from the Navy's VQ-1 Squadron on Guam and VP-6 Squadron from Okinawa, Japan, was coordinated by the U.S. Coast Guard's Marianas Rescue Coordination Center (Guam), Japan Maritime Safety Agency, and Pan Ocean Shipping. Floating debris was ultimately found by rescue personnel, but there was no sign of the 28 crew members.

On 26 October, Colleen's torrential rains and high winds struck central Luzon. Manila experienced widespread flooding. Government offices, schools, and businesses had to close in the metropolitan area. Water was chest-high in many of the communities surrounding Manila, and over 1,300 residents had to be evacuated. One death was reported due to drowning. Farther to the north, the heavy rains triggered landslides which blocked the roads to Baguio.

No reports of fatalities or damage from Colleen's passage were received from Vietnam.